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Carbon neutron star atmospheres

Suleimanov V., Klochkov D., Pavlov G., Werner K.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

The accuracy of measuring the basic parameters of neutron stars is limited in particular by uncertainties in the chemical composition of their atmospheres. For example, the atmospheres of thermally emitting neutron stars in supernova remnants might have exotic chemical compositions, and for one of them, the neutron star in Cas A, a pure carbon atmosphere has recently been suggested by Ho & Heinke. To test this composition for other similar sources, a publicly available detailed grid of the carbon model atmosphere spectra is needed. We have computed this grid using the standard local thermodynamic equilibrium approximation and assuming that the magnetic field does not exceed 10 8 G. The opacities and pressure ionization effects are calculated using the Opacity Project approach. We describe the properties of our models and investigate the impact of the adopted assumptions and approximations on the emergent spectra.

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Keywords

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